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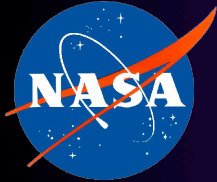
Sounder PEATE Status

NPOESS Preparatory Project (NPP)

**California Institute of Technology
Jet Propulsion Laboratory**

October 16, 2008

*This work was carried out at the Jet Propulsion Laboratory, California Institute of Technology
under a contract with the National Aeronautics and Space Administration.*



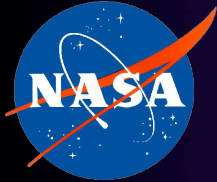
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The Sounder PEATE Platform

- **Budget Plan: *Leveraging!***
 - We'll use anyone's developed code: GRAVITE, IDPS, NOAA
- **Pro Choice!**
 - We don't care if you use, OE, VPD, FD, wet thumb or pie in the sky methods. We are here for you!
- **No Choice!**
 - CMMI is inevitable.
 - But, we'll minimize the impact on scientists who are funded at a level below \$250K annually.
- **We are here to support *Jim the Atmospheric Scientist***

I'm Steve Friedman, and I authorized this presentation!



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Topics

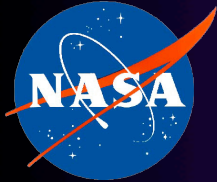
Sounder PEATE 1-Minute Context Overview

Significant Events Since Last Science Team

Application Software and Processing System Status

Hardware Status

Moving Forward to Operations



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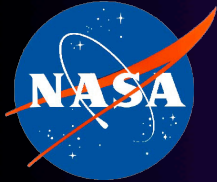
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Sounder PEATE 1-Minute Overview **Sounder PEATE Relationships**

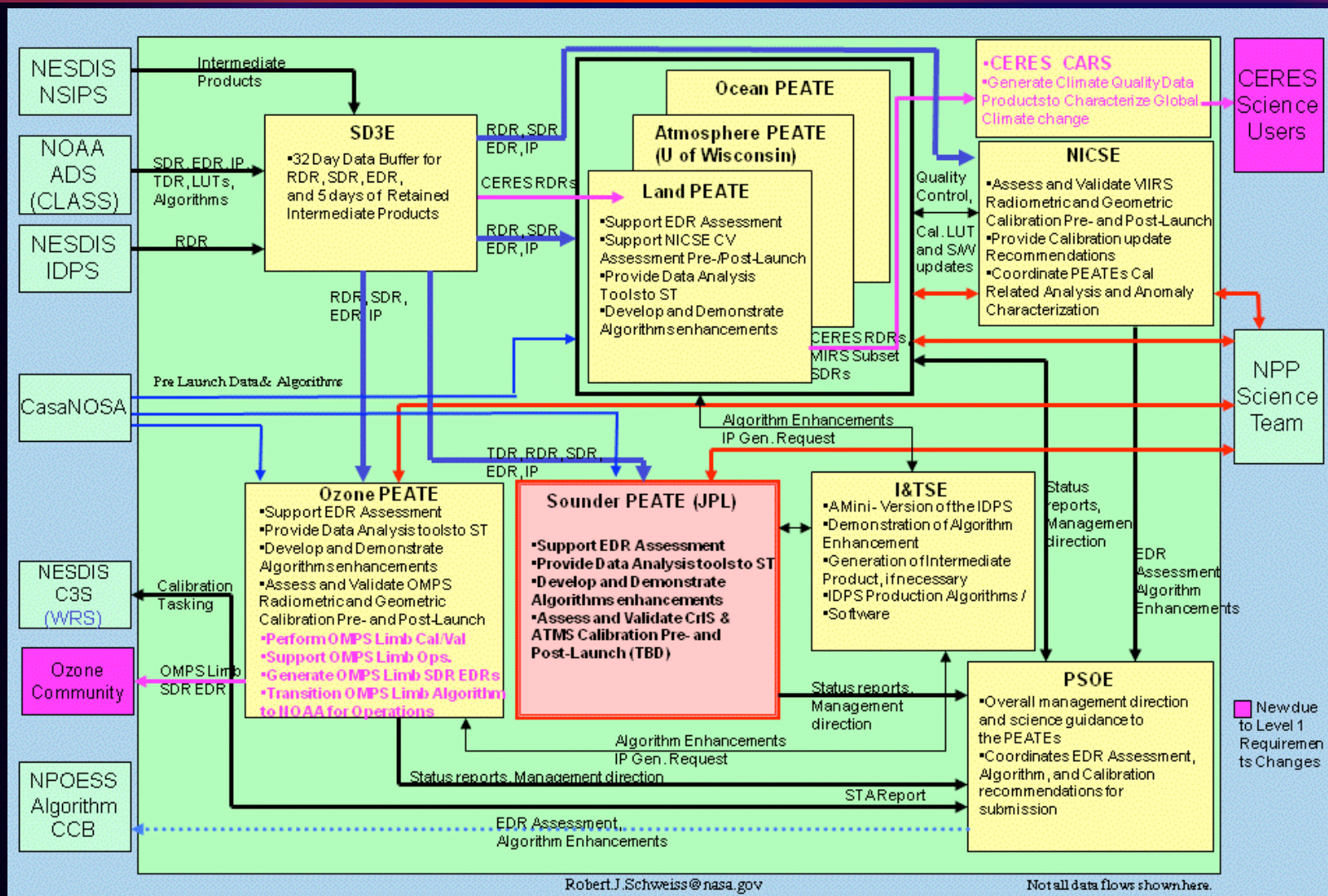
- **Sounder PEATE is one of 5 PEATES and 1 CARS supporting NASA's role in the NPP Program**
- **The Sounder PEATE is:**
 - Part of the Science Data Segment
 - Reports to Science Data Segment Manager
 - Reports to Program Science Office Element (PSOE)
 - A tool of the NPP Sounder Science Team

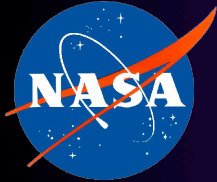


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Sounder PEATE 1-Minute Overview SDS Data Interfaces





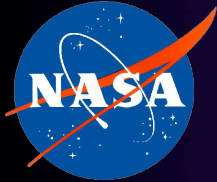
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Sounder PEATE 1-Minute Overview **Role of the Sounder PEATE**

Chief Roles for the Sounder PEATE:

- **Assist the NPP Sounder Science Team in assessing the Climate Quality of EDR Products:**
 - Vertical Temperature Profile
 - Vertical Moisture Profile
 - Vertical Pressure Profile (including surface)
- **Assist the NPP Sounder Science Team in evaluating the NPP Retrieval Code**
 - Evaluate existing code
 - Test and verify potential algorithmic improvements
 - Make recommendations to the PSOE



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Sounder PEATE 1-Minute Overview

Sounder PEATE Responsibilities

- **Support Science Team in assessing and validating:**
 - Climate Quality of EDRs
 - Calibration of Pre-Launch & Post-Launch xDRs
- **Provide data and analysis products to the Science Team**
- **Develop tools for data comparisons :**
 - CrIMSS compared to other instruments
 - CrIMSS compared to correlative data
- **Develop and Demonstrate Algorithm Enhancements**



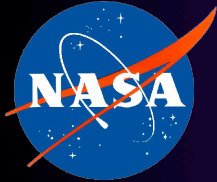
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Sounder PEATE 1-Minute Overview

Sounder PEATE's External Interfaces





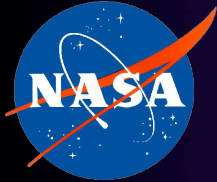
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Sounder PEATE 1-Minute Overview Science Team

- **Sounder Science Team (*based on ROSES funding*)**
 - George Aumann – JPL
 - William Blackwell – Massachusetts Institute of Technology
 - Bjorn Lambrigtsen – JPL
 - Henry Revercomb – University of Wisconsin, Madison
 - Dave Staelin – Massachusetts Institute of Technology
 - Larrabee Strow – University of Maryland, Baltimore County
 - Joel Susskind* – NASA Goddard Space Flight Center

*Interested Party



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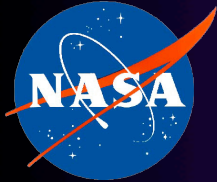
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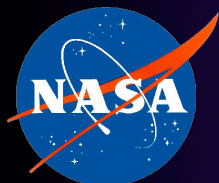


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Significant Events Since Last Science Team Reviews

- **Sounder PEATE participated in Science Data Segment Pre-MOR (Mission Operations Readiness) Review August 27-28, 2008**
 - Sounder PEATE and other PEATEs described their readiness to support operations immediately after launch
 - No significant findings, PEATEs are ready
- **Sounder PEATE conducted a Critical Design Review September 23, 2008**
 - Sounder PEATE ready to begin (continue) implementation and test phases
 - No significant findings!

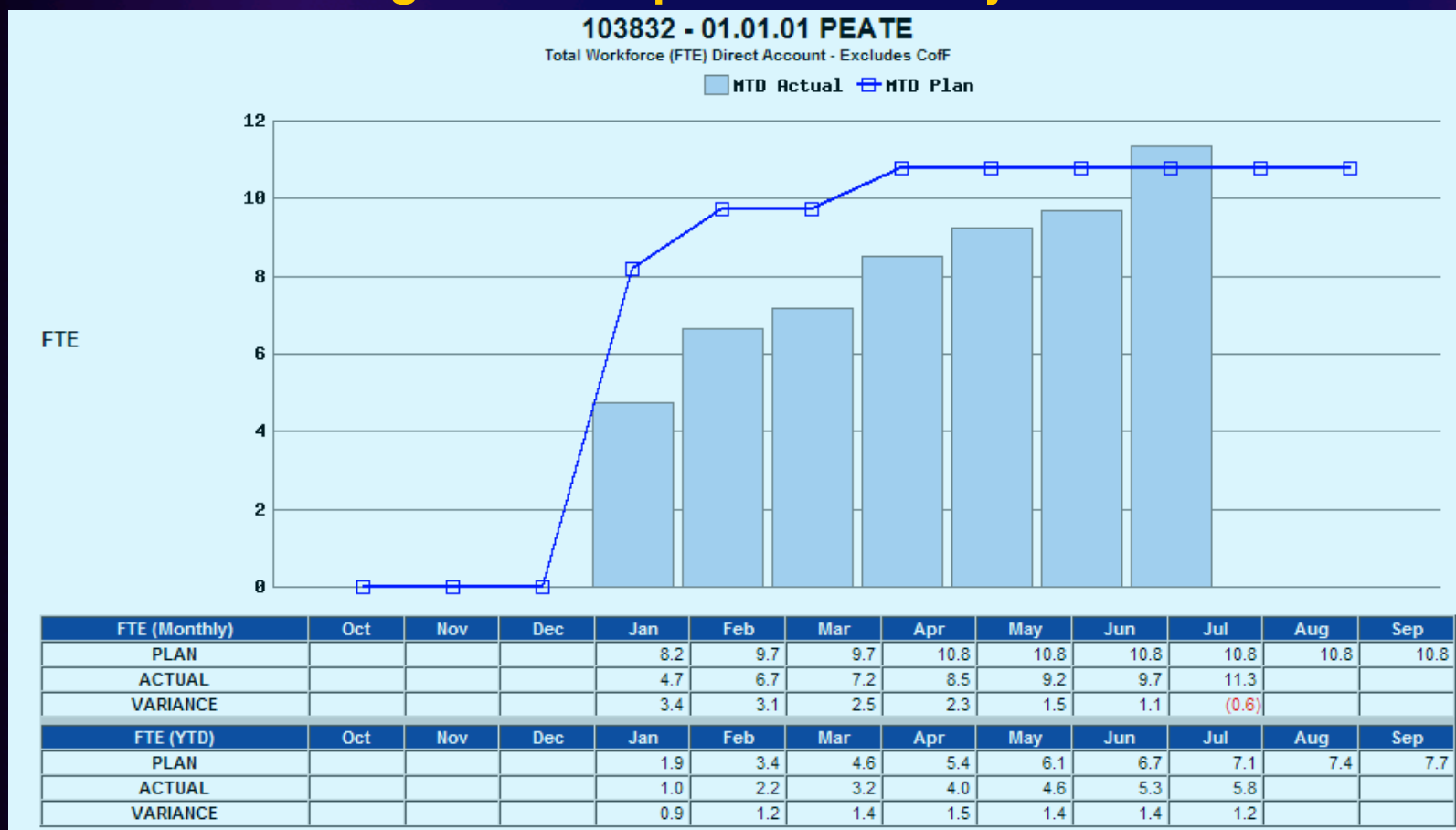


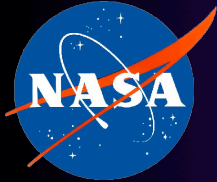
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Significant Events Since Last Science Team Staffing

- Staffing increased from 3.5 FTEs to about 10 FTEs since obtaining new task plan in January



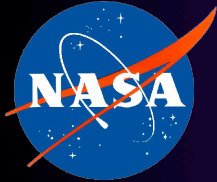


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Significant Events Since Last Science Team System Development Status

- **Sounder PEATE system is running**
 - Implemented two builds
- **Basic system features now available include:**
 - Data ingest
 - Data archive
 - Granule maps
- **We are currently supporting the Science Team**
 - Ingesting MetOp-A data
 - Producing Calibration Subset Products (pre-release version)

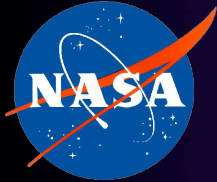


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Significant Events Since Last Science Team Data Archive

- **Current Data Archive – 31 Terabytes (58% full)**
 - Populated with data requested by a Science Team member
 - Recently added additional 18 TB
- **Archive contains large quantities of MetOp-A products**
 - 224,933 IASI L1C files
 - roughly continuous (with small gaps)
from May 2007-Aug 6, 2008
 - plus a few files from Feb - Apr 2007
 - 6234 AMSU L1B files, from May 2008 - Aug 6, 2008
 - 6287 MHS L1B files, from May 2008 - Aug 6, 2008

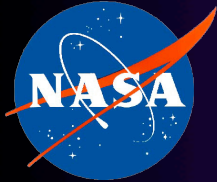


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Significant Events Since Last Science Team Cooperative Efforts

- **NOAA NESDIS (C. Barnett)** **No Change Since PDR**
 - Performing independent Cal/Val of METOP-A and NPP data
 - Performing hybridized AIRS-style retrieval for METOP-A and NPP data – posting data products on CLASS
 - METOP-A – one-year after operations (nominally April 2008)
 - CrIMSS – commences with “operations” (code is ready)
 - May release RAOBS match-ups (w/ proprietary file structure)
 - Sharing software developed in-house with Sounder PEATE
- **IPO/University of Wisconsin** **New Collaboration**
 - IDPS Builds migrated to Linux
- **GRAVITE** **No Change Since PDR**
 - Performing independent Cal/Val of NPP data – products should be available to Sounder PEATE
 - Potentially alternative site to run modified science and production code



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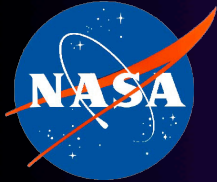
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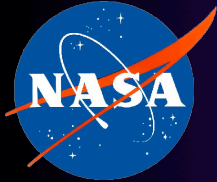
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Application Software and Processing System Status **Current Status**

Development of the Sounder PEATE is well under way

- **System Infrastructure**
 - Basic system infrastructure already operational
 - Complete system infrastructure to be completed by end of year
- **Applications Software**
 - Data ingest and archive fully operational
 - Next release will add initial application functionality
 - IASI granule maps
 - IASI Calibration Subset
 - Match-Up Framework
 - Subsequent releases to emphasize capabilities needed at-launch
- **Understanding of IDPS retrieval software also under way**

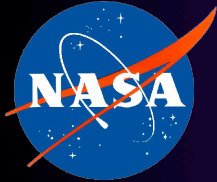


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Application Software and Processing System Status **Additional Pre-Launch Capabilities**

- **Capabilities scheduled for subsequent releases include**
 - Readers/writers for SDRs and EDRs
 - Match-up combinations involving NPP and MetOp-A data with various correlative data
 - Calibration Subsets involving NPP and MetOp-A data
- **IDPS retrieval code improvements may also take place**

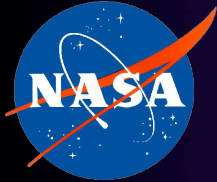


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Application Software and Processing System Status Life After Launch - Beyond the Baseline

- **Current long range plans for NPP call for all PEATES, including the Sounder PEATE to remain in operation through at least two years after launch**
- **Additional builds will be planned and scheduled after launch to include additional necessary features supporting analysis of EDR climate quality**
 - Gridded (Level 3) products from NPP EDRs
 - Specialized IPs, not included in standard EDR IP set
 - Other unique products/tools requested by Science Team



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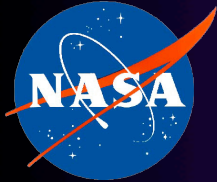
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Application Software and Processing System Status **The SW CCB – Making it all happen**

- **Software Change Control Board guides development**
 - Reviews all work packages
 - Helps the manager prioritize of Sounder PEATE work activities
- **Sounder PEATE Software CCB consists of:**
 - Sounder PEATE System Engineer
 - Sounder PEATE Task Manager
 - Sounder Science Team Member (when available)*

*The Science Team will be notified by email regarding significant feature or scope changes to existing plan.

When a decision requires Science Team input, the CCB will always include a Science Team representative.



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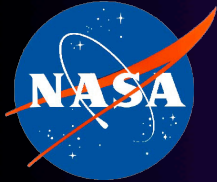
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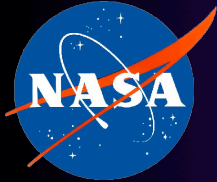
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Hardware Status

Phased Hardware Acquisitions

- **The Souder PEATE plans to acquire and build the Souder PEATE hardware over time, balancing:**
 - Immediate needs and Longer-term needs
 - The economy of acquiring hardware later to obtain more *bang for the buck*
 - Mitigating risks as much as possible
- **Initial hardware on site now, more on order**
- **All facility modifications will take place late in the 2008 calendar year**
 - Power
 - Air Conditioning
 - Fire Safety



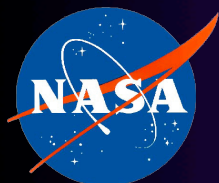
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Hardware Status **Hardware Acquisition Plan**

- **Early Development Stage** (*received, Spring 2007*)
 - Obtain small set of Linux processors sufficient to develop and demonstrate local processing capability
- **Early FY09** (*operational by December 2008*)
 - Development Server (1 Sun Blade*)
 - Initial Compute Server (1 Sun Blade*)
 - Storage Network – 200 TB Sun RAID (initial build)
- **FY10 (as late as possible)**
 - Augment Compute Server w/ 4 additional Sun Blades*
 - Add additional 200 TB RAID
 - *on order

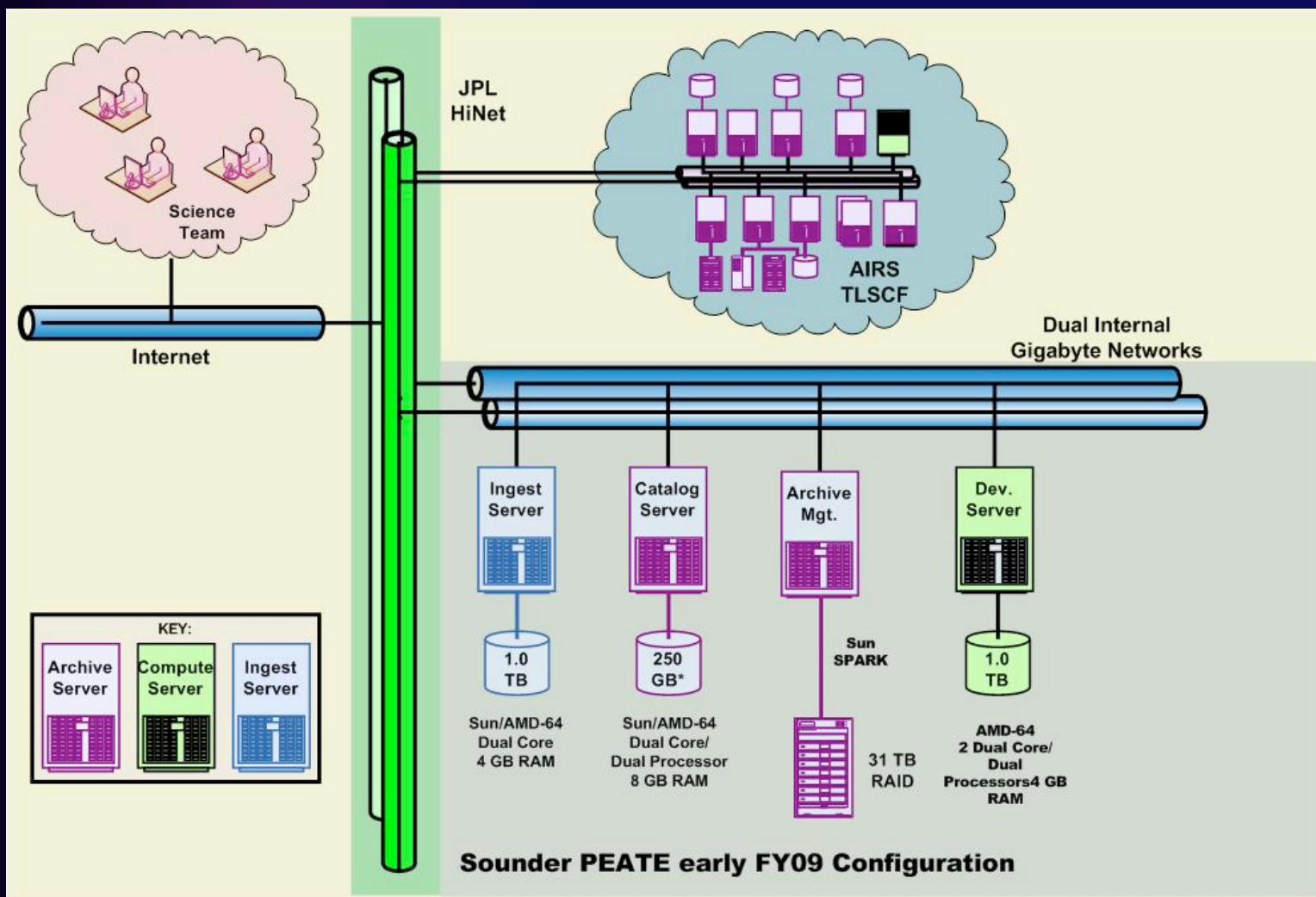
*Each Sun Blade consists of 4 quad-core boards, a total of 16 processors.

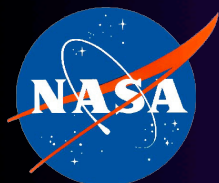


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Hardware Status Current Configuration

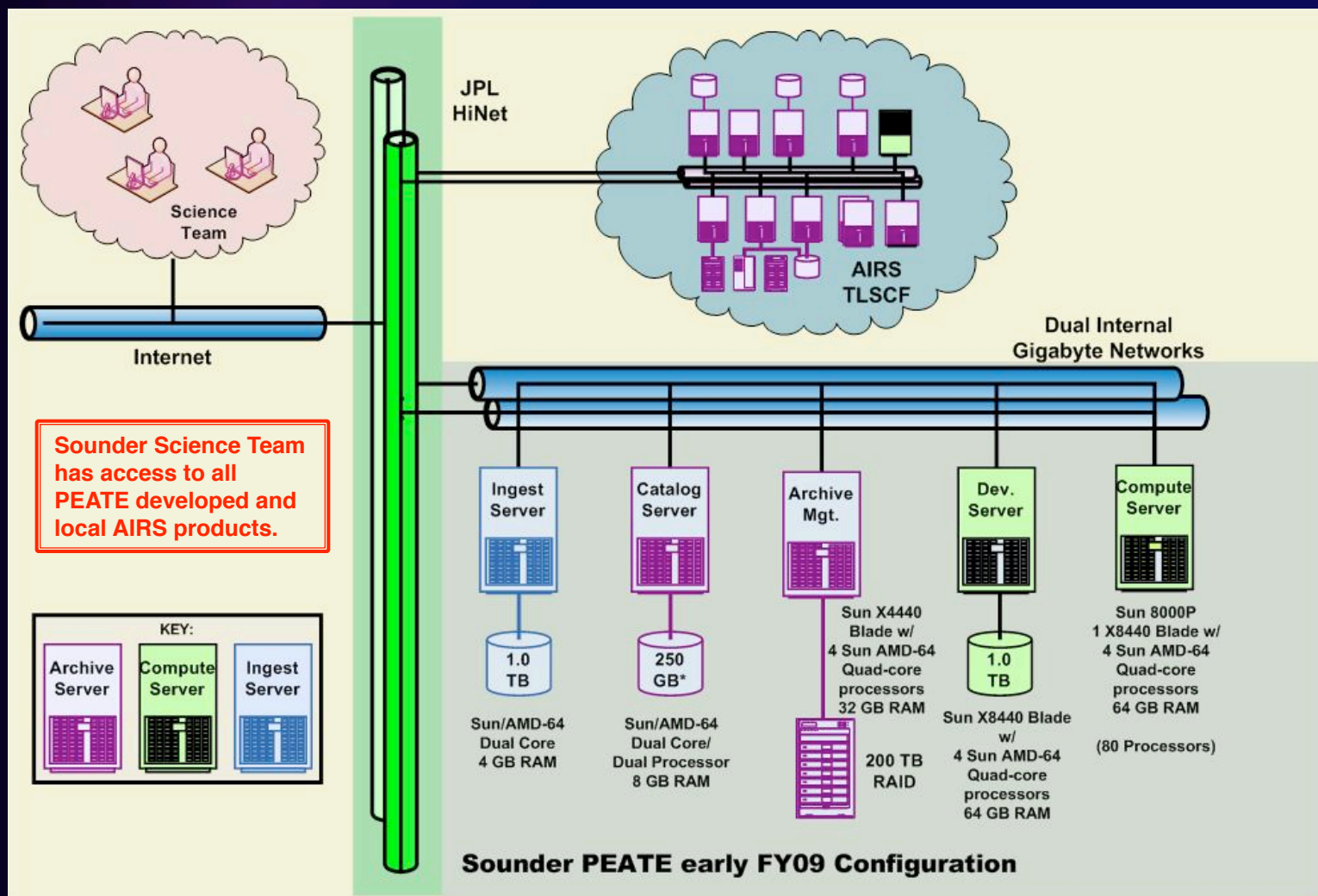


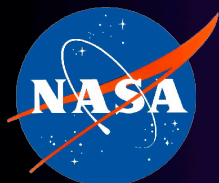


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Hardware Status Early FY09 Upgrade Configuration*

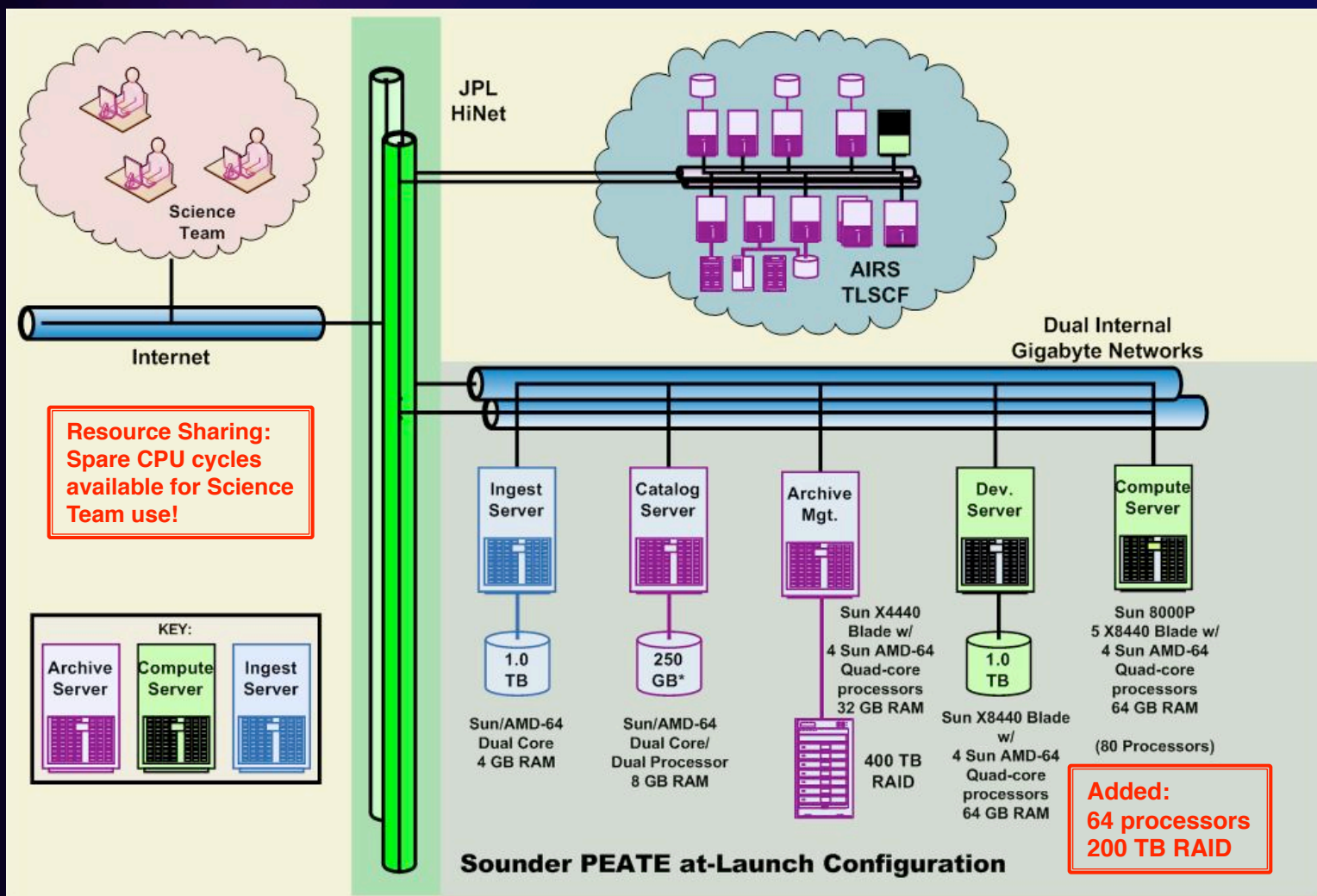


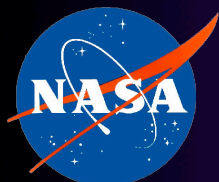


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Hardware Status Pre-Launch (nominally 6MOS before launch)





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Hardware Status Configurations FY08 – FY12

	FY08	FY09	FY10	FY11	FY12*
Compute Server		Sun 8000P 1 X8440 Blade w/ 4 Sun AMD-64 Quad-core processors (16 Processors) 64 GB RAM	Sun 8000P 5 X8440 Blade w/ 4 Sun AMD-64 Quad-core processors (16 Processors) 64 GB RAM	Evaluate need for additional processors	Evaluate need for additional processors
Data Archive	31 TB	200 TB RAID	400 TB RAID	500 TB RAID	600 TB RAID
Development Server	Sun V4100 2 Dual Core/ Processors	Sun X4400 Blade w/ 4 Sun AMD-64 Quad-core Processors 64 GB RAM	Same	Same	Same

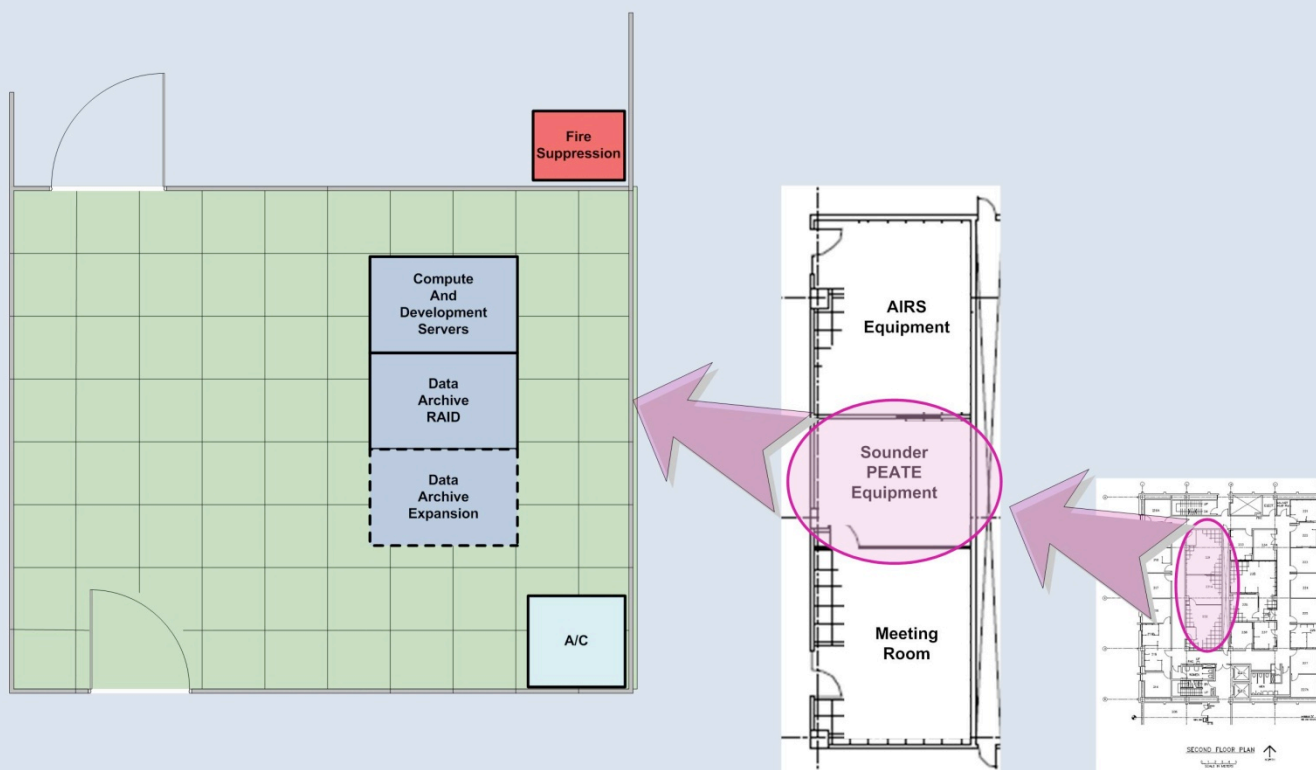
*System Refresh planned in FY13

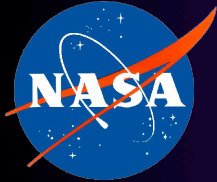


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Hardware Status Facility Configuration





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Hardware Status

Moving Forward to Operations

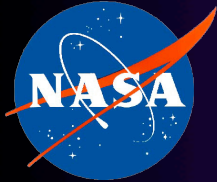


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Moving Forward to Operations **Sounder PEATE Operations Concept**

- **Operations Concepts**
 - Routine Processing
 - 24 hour access to computers
 - Staffed by operator during normal week-day “business” hours
 - Special Processing
 - Critical job processing during off-work hours by remote monitoring
 - Science Team access of “excess” computing resources
 - Science Team Use of PEATE Resources
 - **Science Team may access “excess” computing resources**
- **Operations Staffing**
 - One operator (50% funded)
 - Back-up operator support, to fill in during vacation, sickness



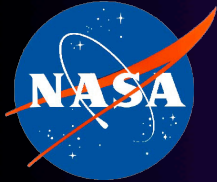
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Moving Forward to Operations

A Day in the Life of the Sounder PEATE (1 of 2)

- **Each day, the Sounder PEATE will:**
 - Ingest and catalog all ordered data
 - Typically an automated process
 - Operator verifies state of affairs and resolves conflicts
 - Generate and catalog new products
 - Calibration Subsets and Match-Ups
 - Gridded Products, Maps, more ...
 - Support Science Team in ad-hoc data processing requests
 - Custom PGEs
 - Provide access to Sounder PEATE compute resources
 - Tools
 - Test and analyze changes to retrieval code in local environment



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Moving Forward to Operations

A Day in the Life of the Sounder PEATE (2 of 2)

- **Every day PEATE will receive:**
 - ~95 GB CrIMSS data from GSFC SDS SD3E:
 - 18 GB RDR
 - 55 GB SDR, TDR + GEO
 - <1 GB EDR + GEO
 - <1 GB spacecraft ephemeris
 - ~20 GB IP (estimate)
 - ~65 GB from elsewhere:
 - ~40 GB MetOp-A L1 + L2 from NOAA CLASS
 - ~20 GB Forecast + analysis (ECMWF, NCEP)
 - <1 GB Correlative data: Radiosondes, ARM/CART
 - ~5 GB AIRS Science Team algorithm MetOp-A and/or CrIMSS from CLASS
 - TBD GB VIIRS SDR + GEO from SD3E or CLASS:
 - For one channel: M15 = 14.7 GB/day, Geo = 92.5 GB/day
 - Exploring acquiring a smaller subset or use of other derived data products

